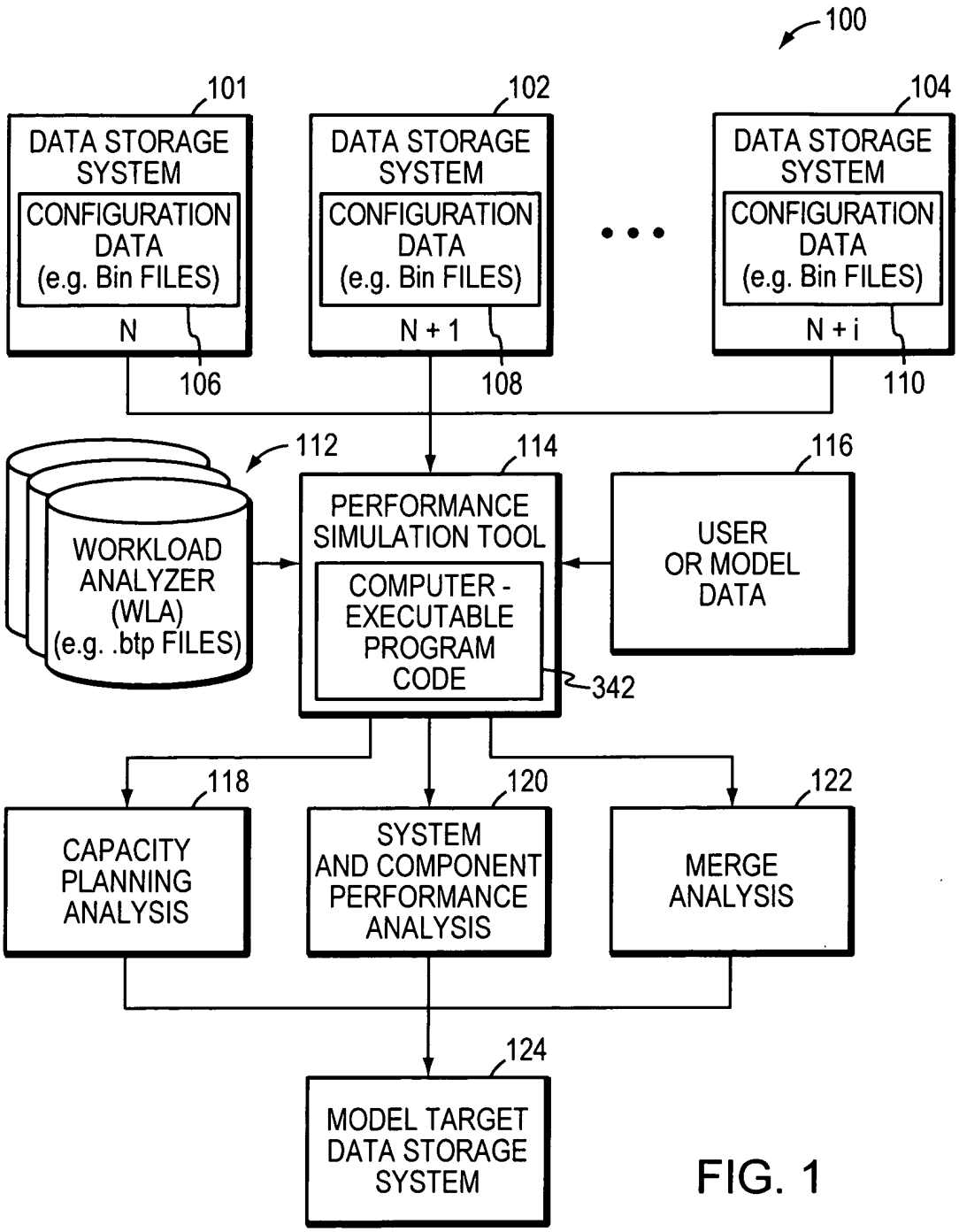
100
101
DATA STORAGE SYSTEM
CONFIGURATION DATA (e.g. Bin FILES)
N
106
102
DATA STORAGE SYSTEM
CONFIGURATION DATA (e.g. Bin FILES)
N + 1
108
104
DATA STORAGE SYSTEM
CONFIGURATION DATA (e.g. Bin FILES)
N + i
110
112
WORKLOAD ANALYZER (WLA) (e.g. .btp FILES)
114
PERFORMANCE SIMULATION TOOL
COMPUTER - EXECUTABLE PROGRAM CODE
342
116
USER OR MODEL DATA
118
CAPACITY PLANNING ANALYSIS
120
SYSTEM AND COMPONENT PERFORMANCE ANALYSIS
122
MERGE ANALYSIS
124
MODEL TARGET DATA STORAGE SYSTEM

FIG. 1

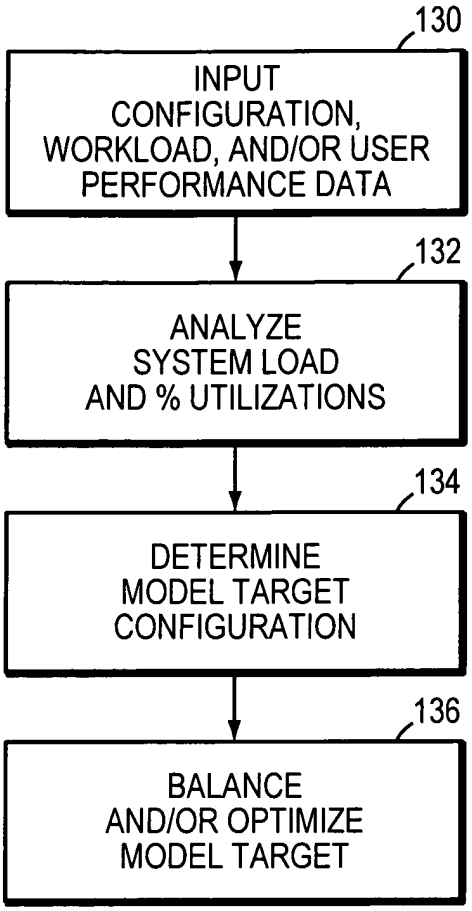
130
INPUT CONFIGURATION, WORKLOAD, AND/OR USER PERFORMANCE DATA
132
ANALYZE SYSTEM LOAD AND % UTILIZATIONS
134
DETERMINE MODEL TARGET CONFIGURATION
136
BALANCE AND/OR OPTIMIZE MODEL TARGET

FIG. 2

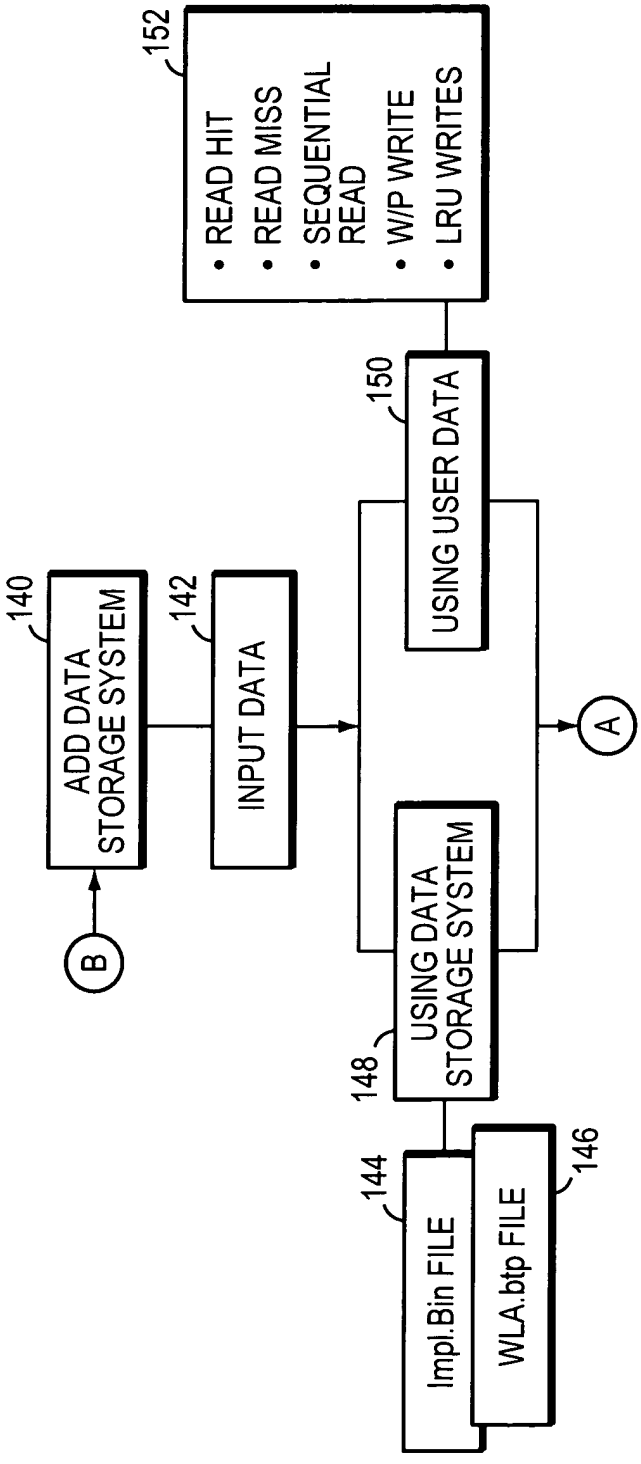
152
• READ HIT
• READ MISS
• SEQUENTIAL READ
• W/P WRITE
• LRU WRITES
150
USING USER DATA
140
ADD DATA STORAGE SYSTEM
142
INPUT DATA
A
B
148
USING DATA STORAGE SYSTEM
144
Impl.Bin FILE
146
WLA.btp FILE

FIG. 3

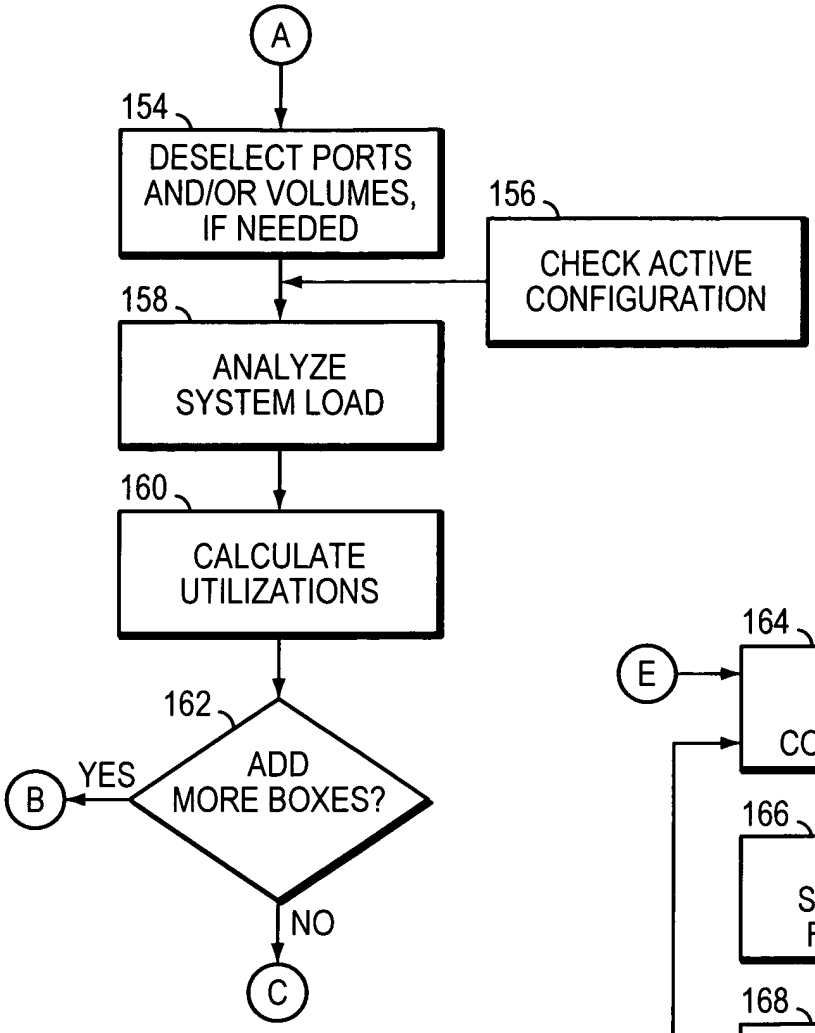
A
154
DESELECT PORTS AND/OR VOLUMES, IF NEEDED
156
CHECK ACTIVE CONFIGURATION
158
ANALYZE SYSTEM LOAD
160
CALCULATE UTILIZATIONS
162
ADD MORE BOXES?
YES
B
NO
C

FIG. 4

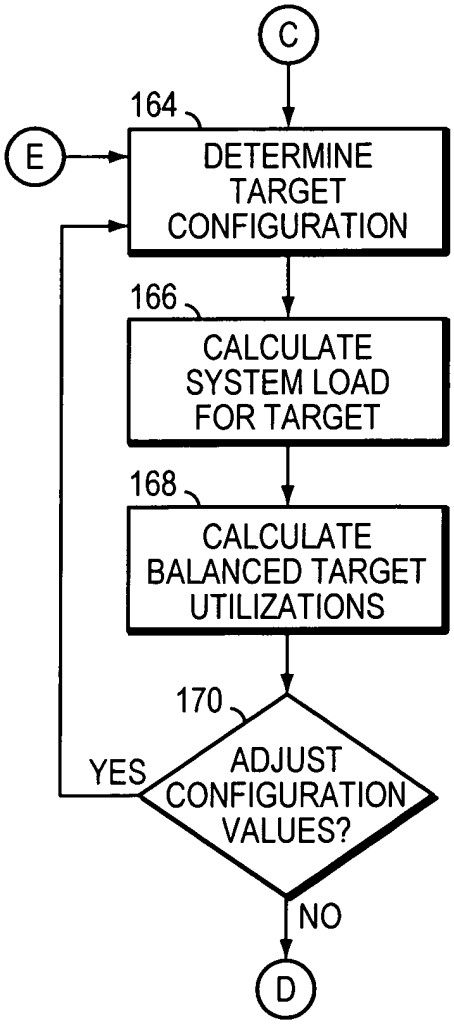
C
164
E
DETERMINE TARGET CONFIGURATION
166
CALCULATE SYSTEM LOAD FOR TARGET
168
CALCULATE BALANCED TARGET UTILIZATIONS
170
YES
ADJUST CONFIGURATION VALUES?
NO
D

FIG. 5

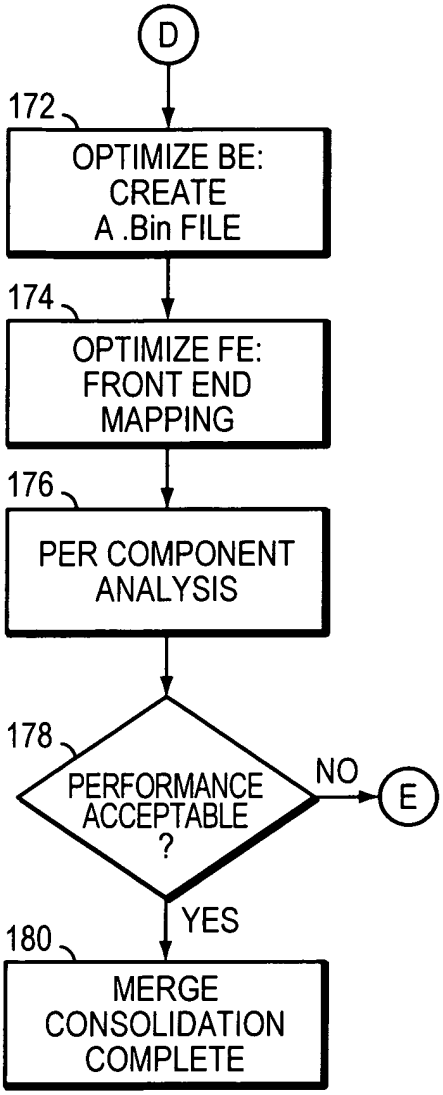
D
172
OPTIMIZE BE: CREATE A .Bin FILE
174
OPTIMIZE FE: FRONT END MAPPING
176
PER COMPONENT ANALYSIS
178
PERFORMANCE ACCEPTABLE ?
NO
E
YES
180
MERGE CONSOLIDATION COMPLETE

FIG. 6

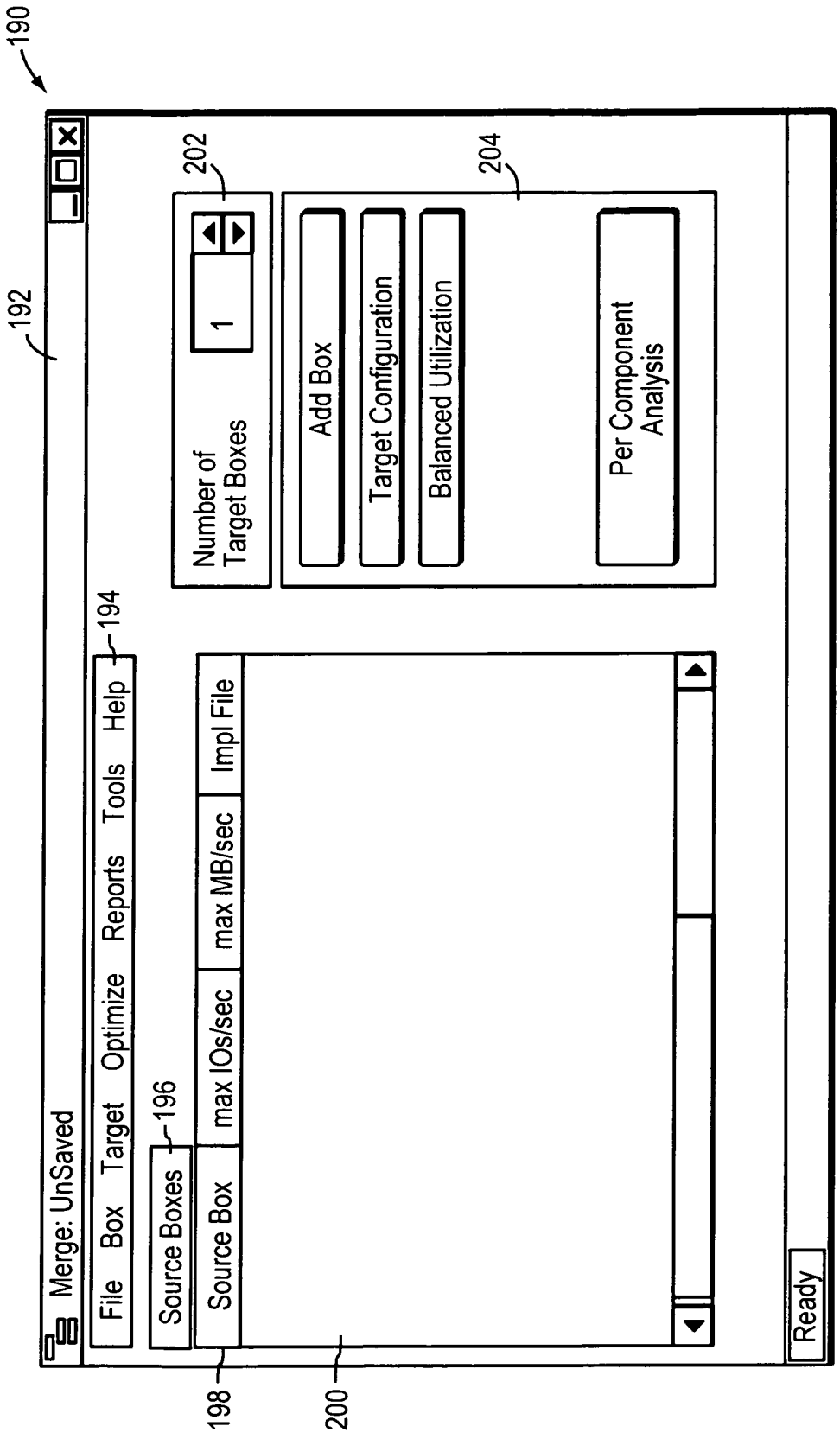
190
192
Merge: UnSaved
File Box Target Optimize Reports Tools Help
194
Source Boxes
196
Source Box
max IOs/sec
max MB/sec
Impl File
198
200
202
Number of Target Boxes
1
204
Add Box
Target Configuration
Balanced Utilization
Per Component Analysis
Ready

FIG. 7

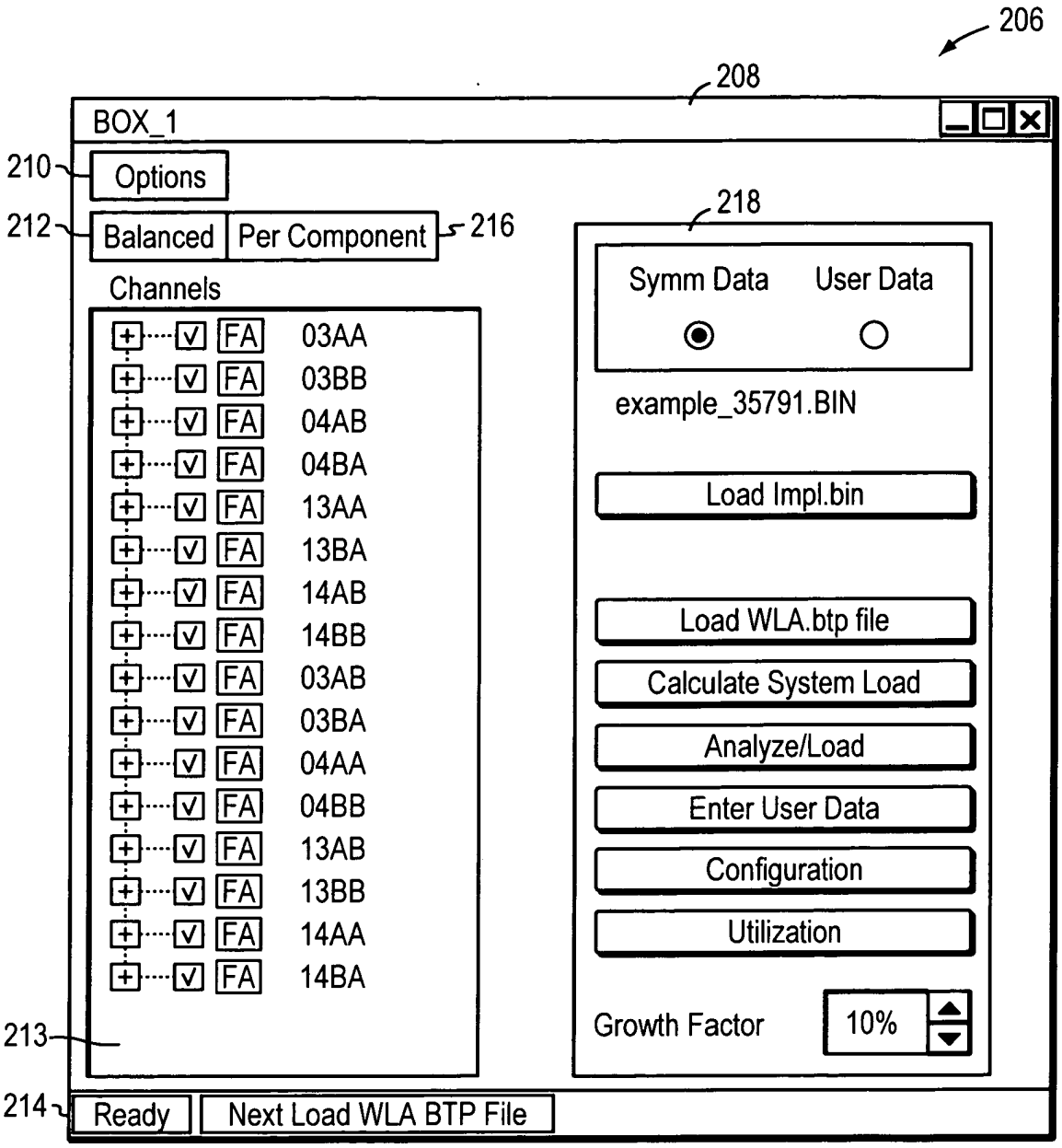
206
208
BOX_1
210
Options
212
Balanced
Per Component
216
218
Channels
Symm Data
User Data
example_35791.BIN
Load Impl.bin
Load WLA.btp file
Calculate System Load
Analyze/Load
Enter User Data
Configuration
Utilization
Growth Factor
10%
213
214
Ready
Next Load WLA BTP File
FA 03AA
FA 03BB
FA 04AB
FA 04BA
FA 13AA
FA 13BA
FA 14AB
FA 14BB
FA 03AB
FA 03BA
FA 04AA
FA 04BB
FA 13AB
FA 13BB
FA 14AA
FA 14BA

FIG. 8

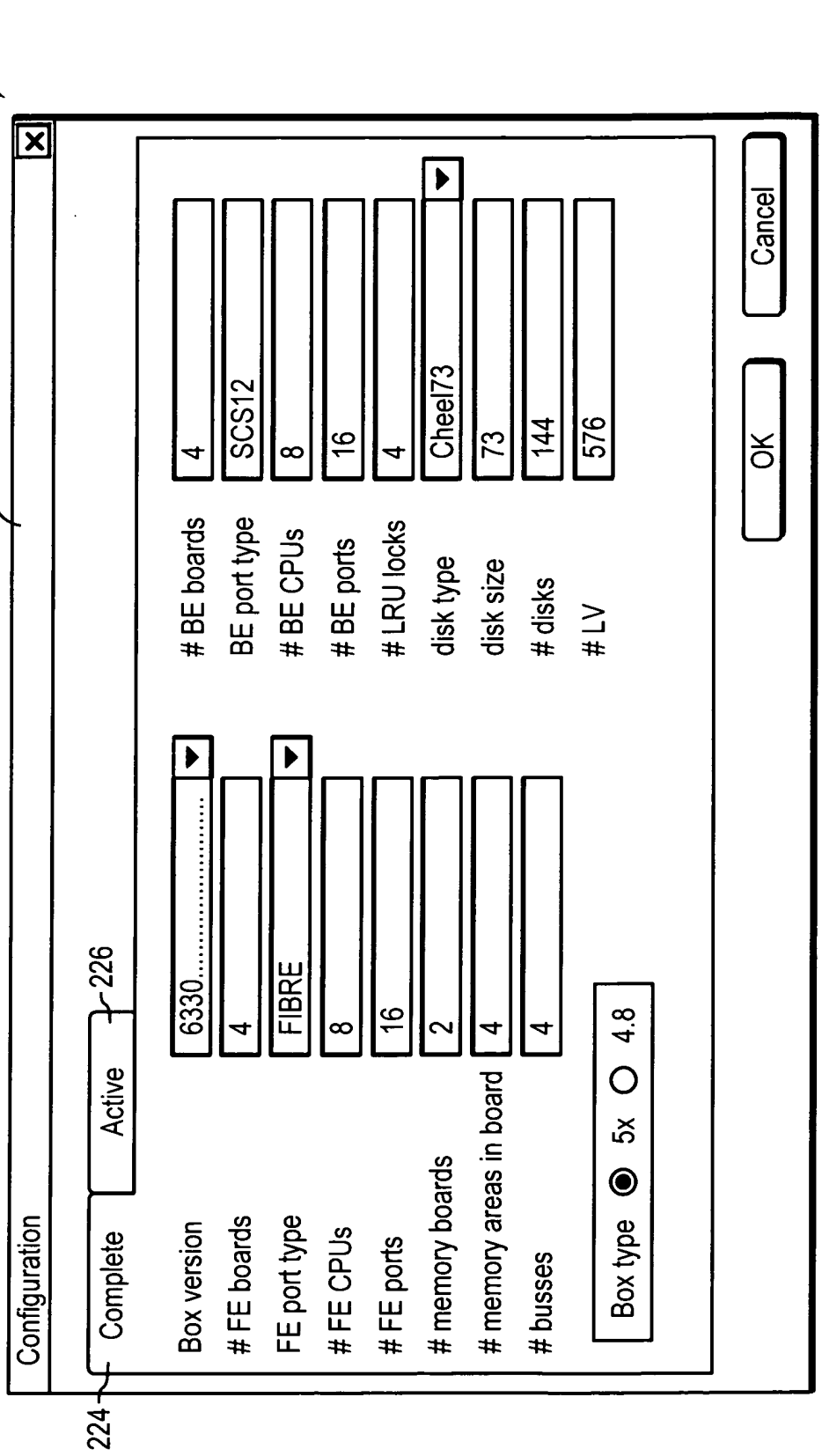
220
222
224
226
Configuration
Complete
Active
Box version
# FE boards
FE port type
# FE CPUs
# FE ports
# memory boards
# memory areas in board
# busses
6330.....
4
FIBRE
8
16
2
4
4
Box type 5x 4.8
# BE boards
BE port type
# BE CPUs
# BE ports
# LRU locks
disk type
disk size
# disks
# LV
4
SCS12
8
16
4
Cheel73
73
144
576
OK
Cancel

FIG. 9

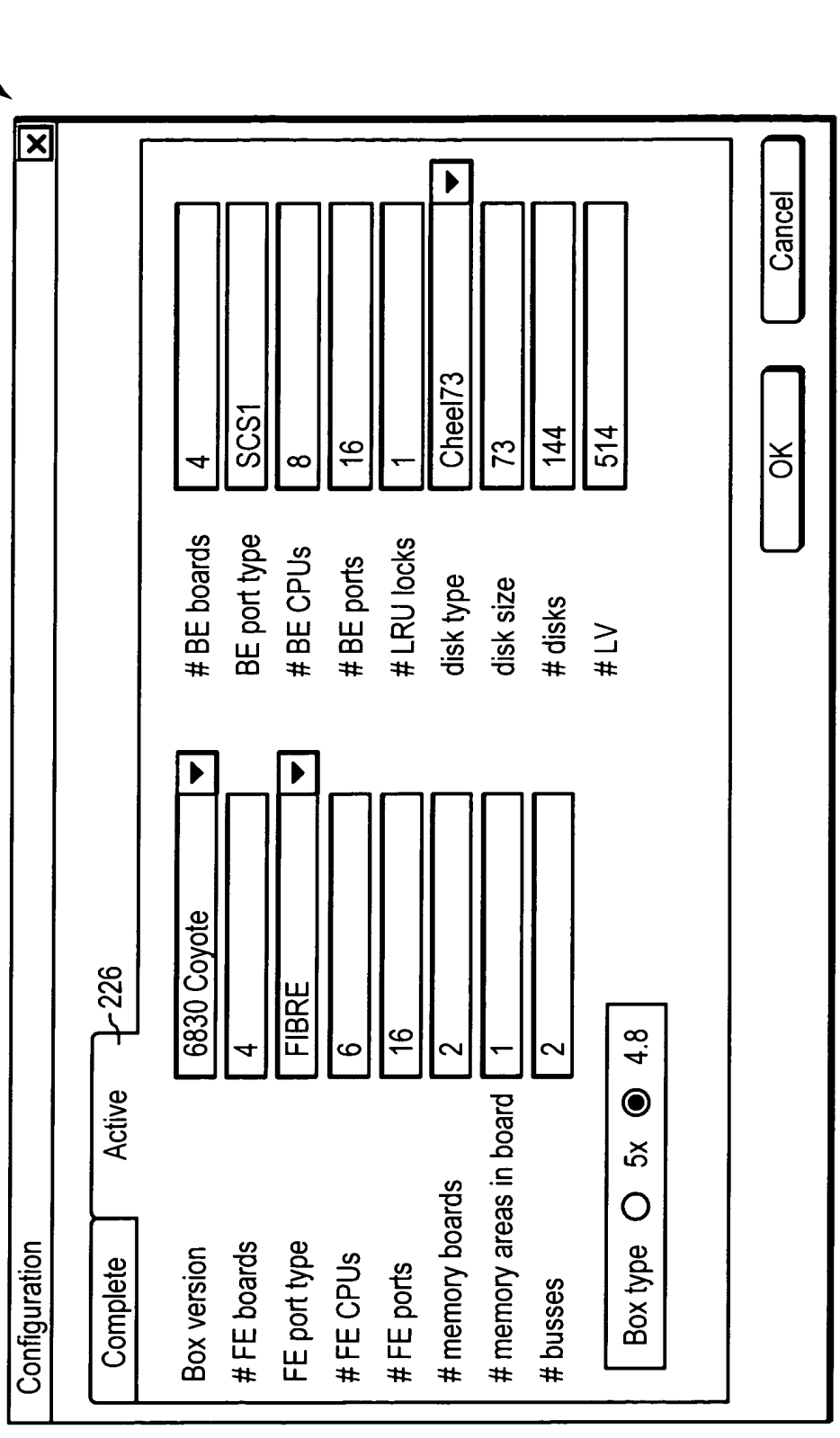
220
Configuration
Complete
Active
226
Box version
# FE boards
FE port type
# FE CPUs
# FE ports
# memory boards
# memory areas in board
# busses
6830 Coyote
4
FIBRE
6
16
2
1
2
Box type 5x 4.8
# BE boards
BE port type
# BE CPUs
# BE ports
# LRU locks
disk type
disk size
# disks
# LV
4
SCS1
8
16
1
Cheel73
73
144
514
OK
Cancel

FIG. 10

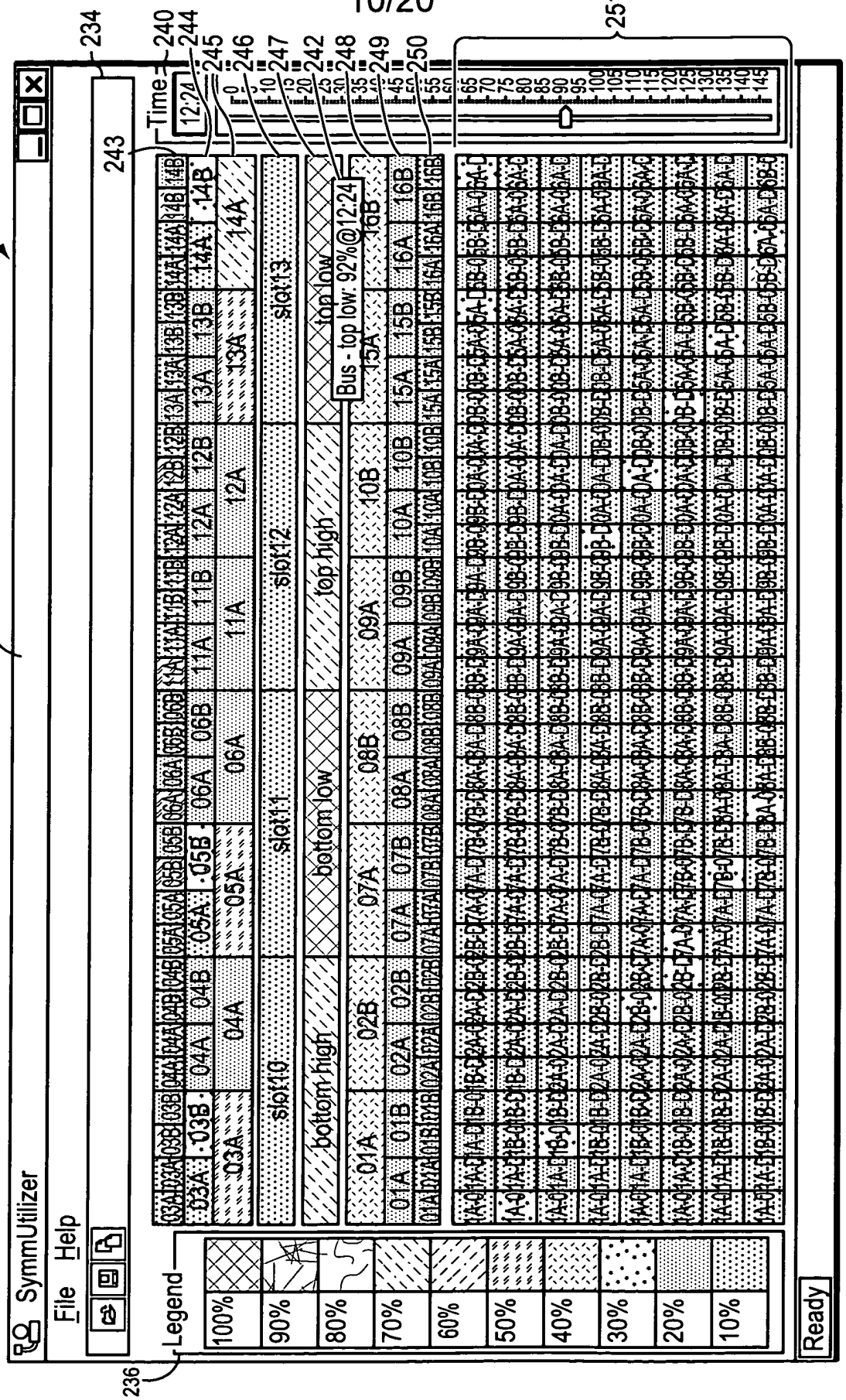


FIG. 11

BEST AVAILABLE COPY

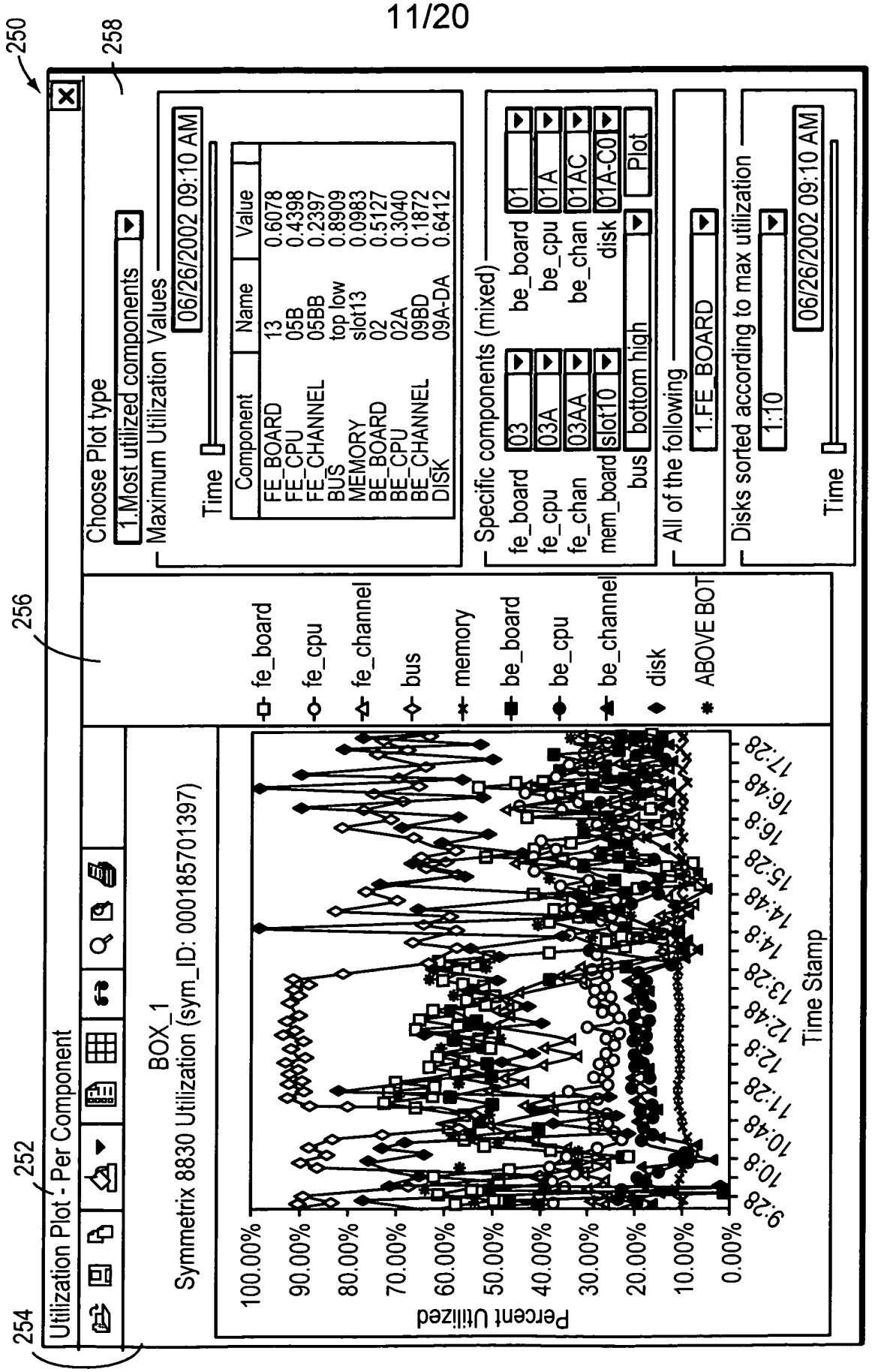


FIG. 12

BEST AVAILABLE COPY

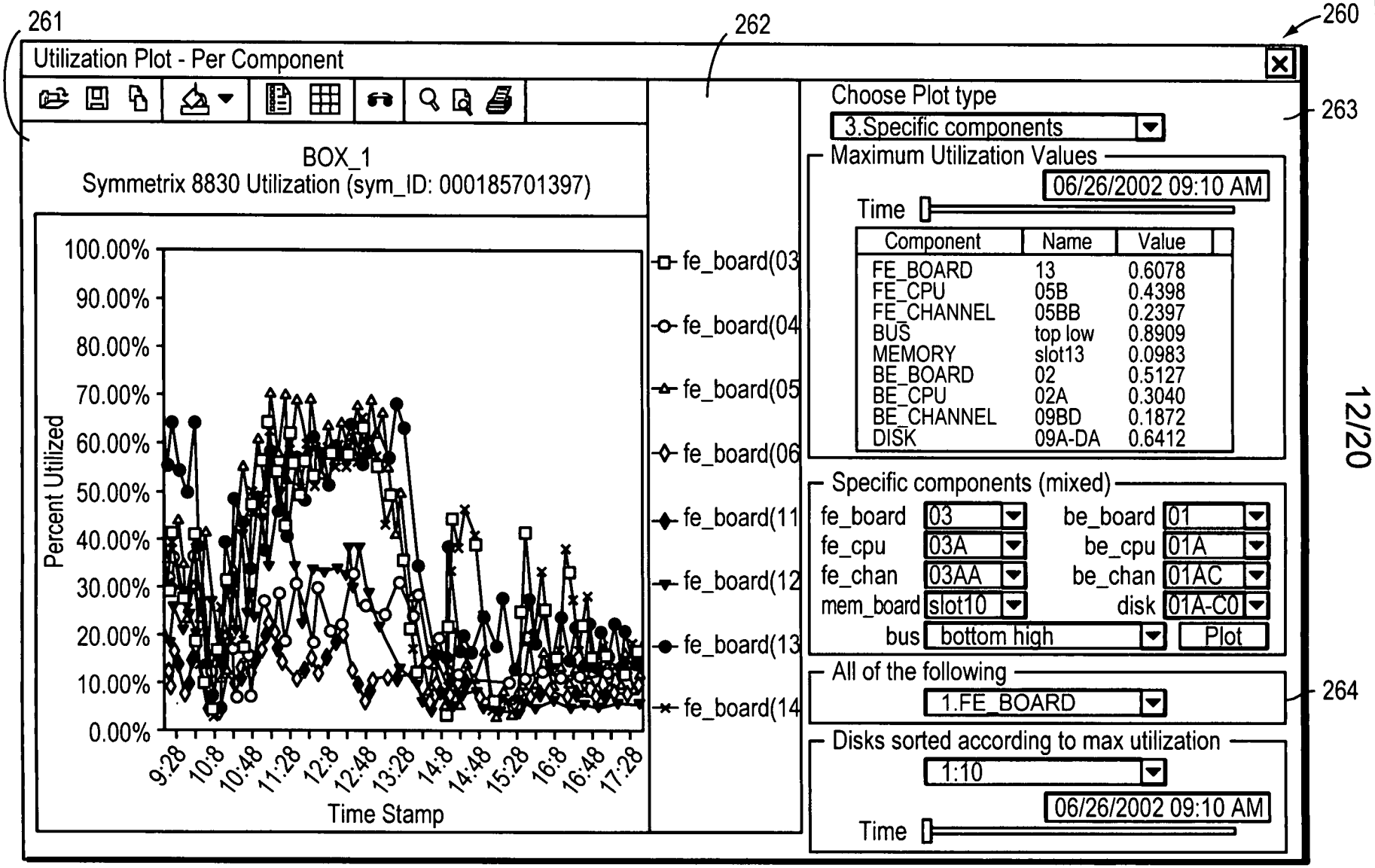


FIG. 13

BEST AVAILABLE COPY

Applicants: Dan Aharoni, et al
U.S.S.N.: Not Yet Assigned
Title: *System and Method For Determining Configuration ...*
Filing Date: Not Yet Assigned / Docket No.: EMC—02-141CIP1
Attorney: Robert Kevin Perkins, Esq. (Reg. No. 36,634)
Express Mail Mailing Label No. EK900600477US

Applicants: Dan Aharoni, et al
U.S.S.N.: Not Yet Assigned
Title: *System and Method For Determining Configuration ...*
Filing Date: Not Yet Assigned / Docket No.: EMC—02-141CIP1
Attorney: Robert Kevin Perkins, Esq. (Reg. No. 36,634)
Express Mail Mailing Label No. EK900600477US



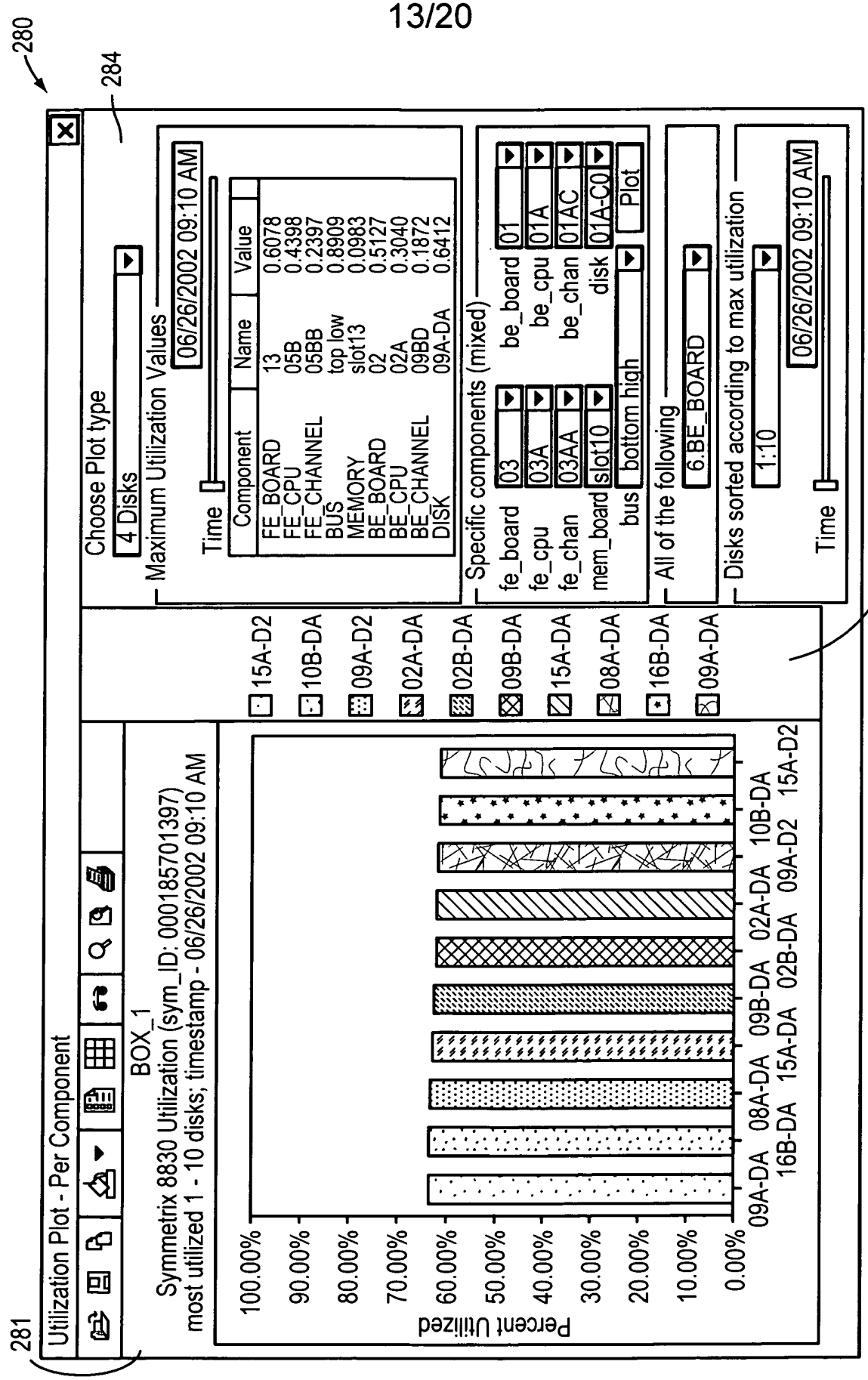


FIG. 14

BEST AVAILABLE COPY

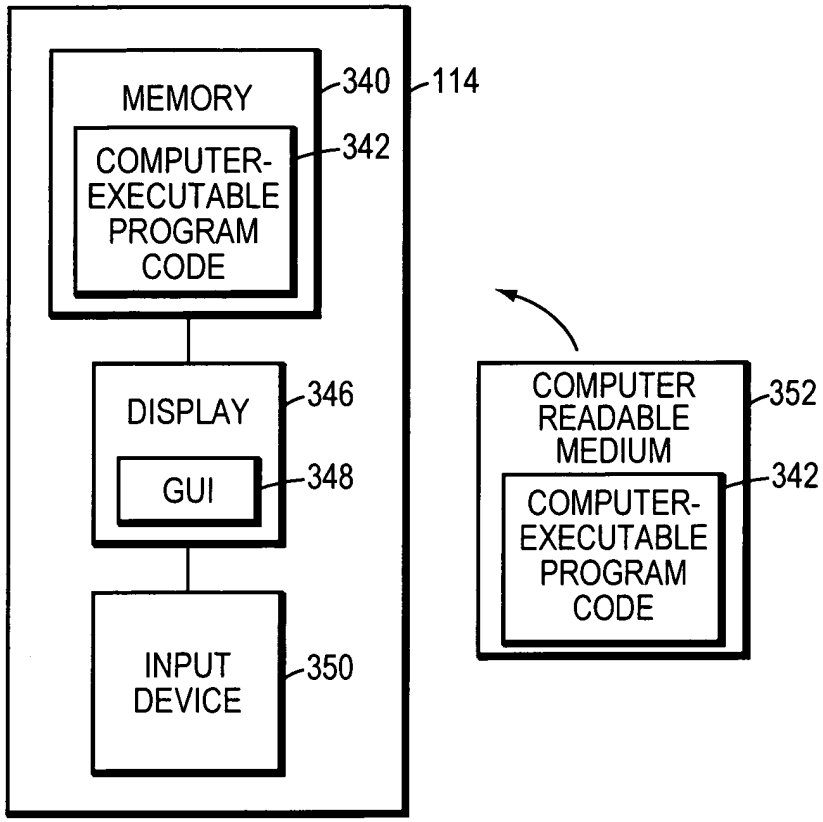
MEMORY
340
114
COMPUTER-EXECUTABLE PROGRAM CODE
342
DISPLAY
346
GUI
348
INPUT DEVICE
350
COMPUTER READABLE MEDIUM
352
COMPUTER-EXECUTABLE PROGRAM CODE
342

FIG. 15

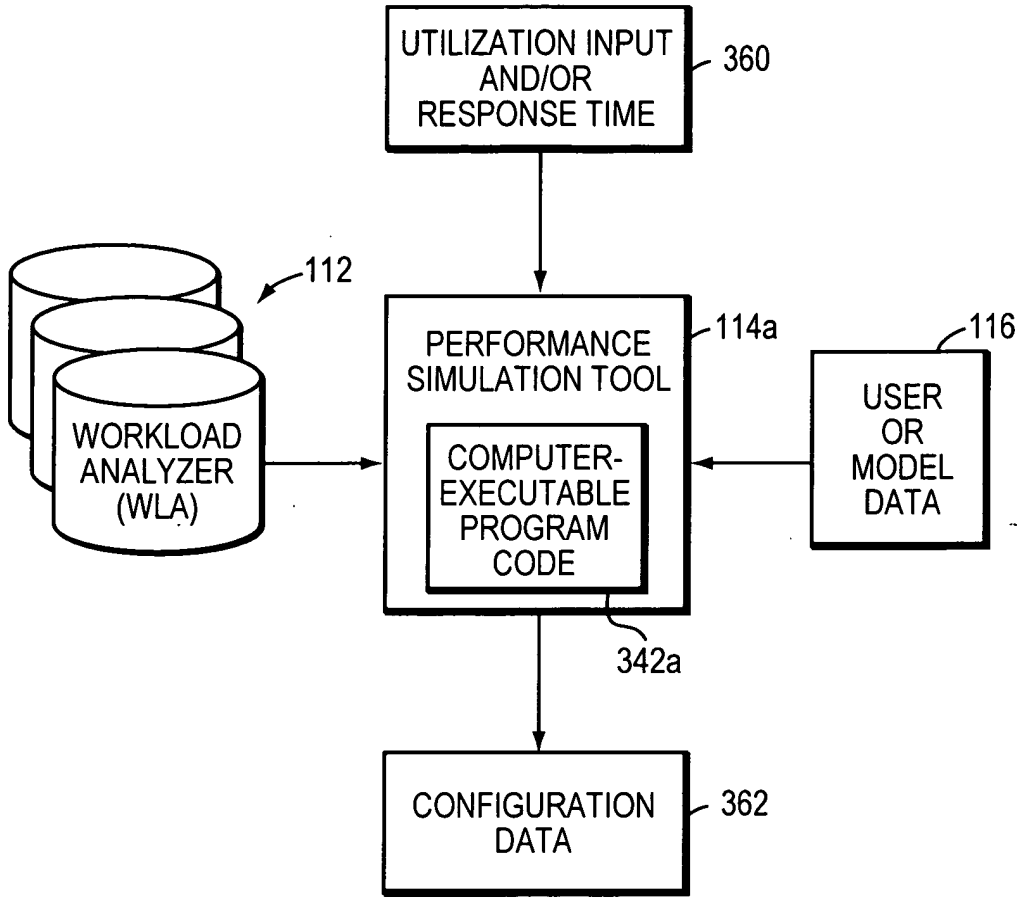
UTILIZATION INPUT AND/OR RESPONSE TIME
360
112
WORKLOAD ANALYZER (WLA)
PERFORMANCE SIMULATION TOOL
114a
COMPUTER-EXECUTABLE PROGRAM CODE
342a
116
USER OR MODEL DATA
CONFIGURATION DATA
362

FIG. 16

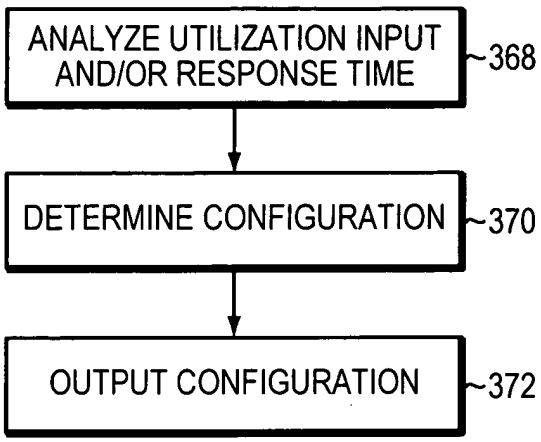
ANALYZE UTILIZATION INPUT AND/OR RESPONSE TIME
368
DETERMINE CONFIGURATION
370
OUTPUT CONFIGURATION
372

FIG. 17

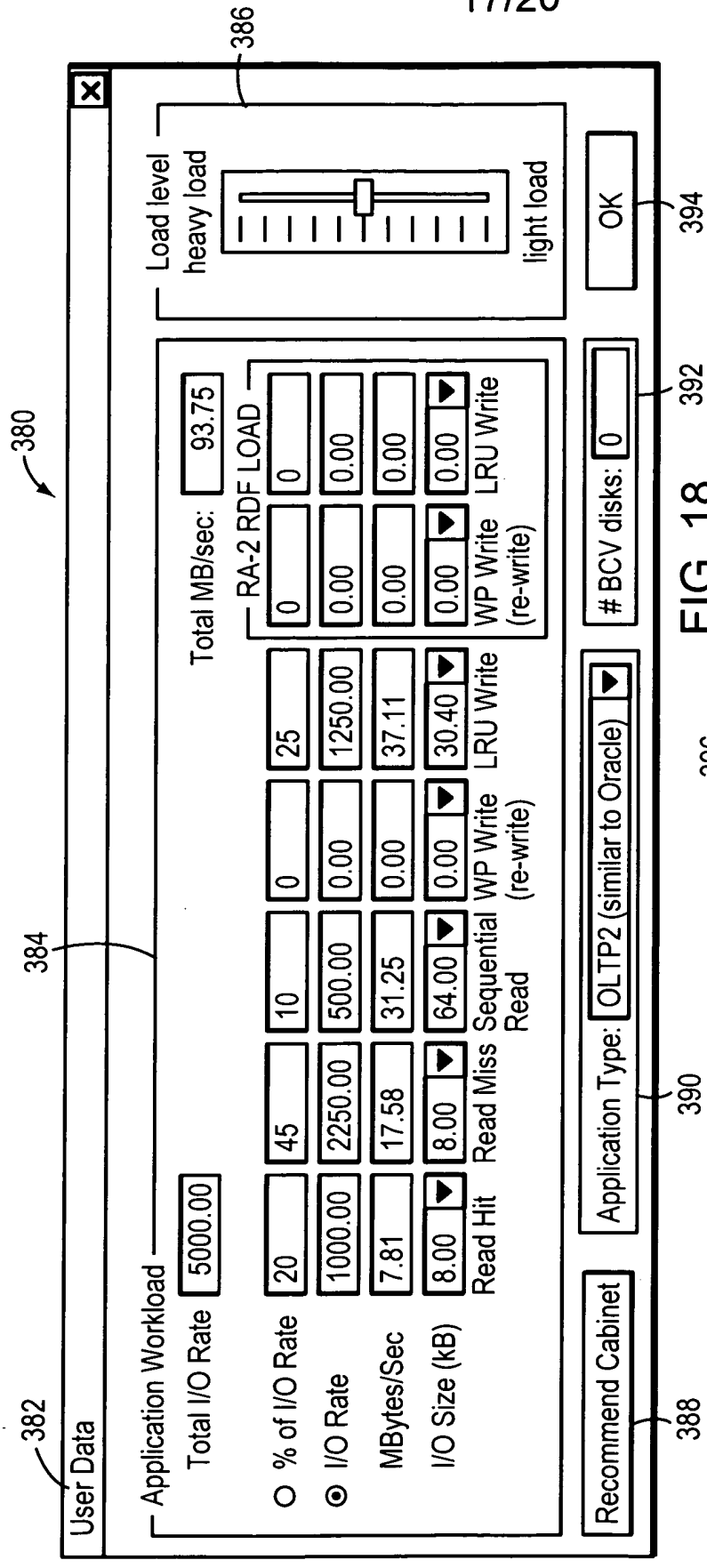
User Data
382
Application Workload
384
Total I/O Rate
5000.00
% of I/O Rate
I/O Rate
MBytes/Sec
I/O Size (kB)
20
1000.00
7.81
8.00
45
2250.00
17.58
8.00
Read Hit
Read Miss
10
500.00
31.25
64.00
0
0.00
0.00
0.00
Sequential
WP Write
(re-write)
25
1250.00
37.11
30.40
LRU Write
Total MB/sec:
93.75
RA-2 RDF LOAD
0
0.00
0.00
0.00
WP Write
(re-write)
0
0.00
0.00
0.00
LRU Write
Load level
heavy load
light load
386
OK
394
# BCV disks:
0
392
Application Type:
OLTP2 (similar to Oracle)
390
Recommend Cabinet
388
380
396
Recommend
402
Cancel
404
Recommendation
398
Cabinet Recommendation
Usable Capacity (TB):
16
Minimum # of Hosts (Ports):
16
400

FIG. 18

FIG. 19

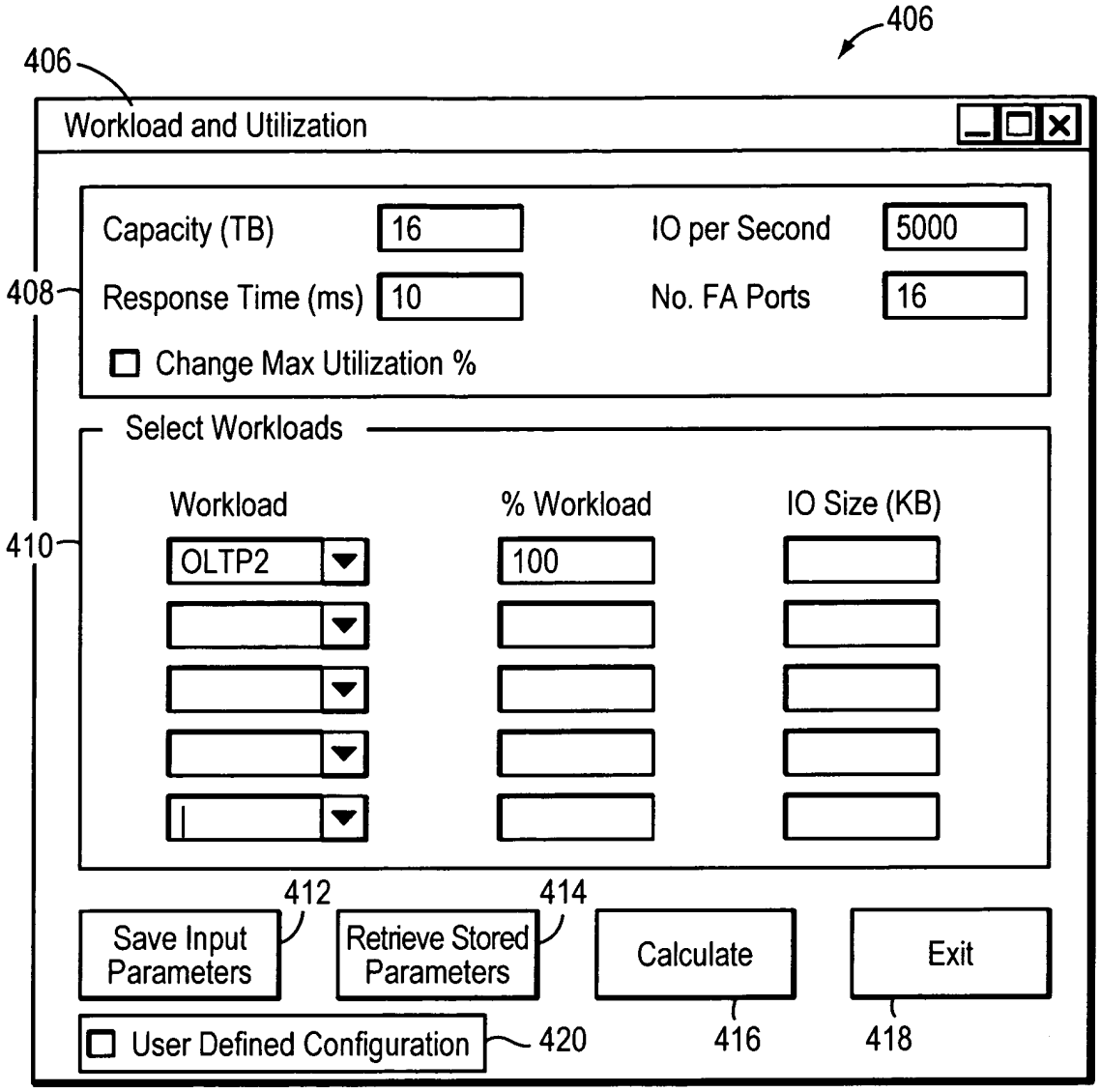
406
406
Workload and Utilization
Capacity (TB)
16
IO per Second
5000
408
Response Time (ms)
10
No. FA Ports
16
Change Max Utilization %
Select Workloads
Workload
% Workload
IO Size (KB)
410
OLTP2
100
412
414
Save Input Parameters
Retrieve Stored Parameters
Calculate
Exit
User Defined Configuration
420
416
418

FIG. 20

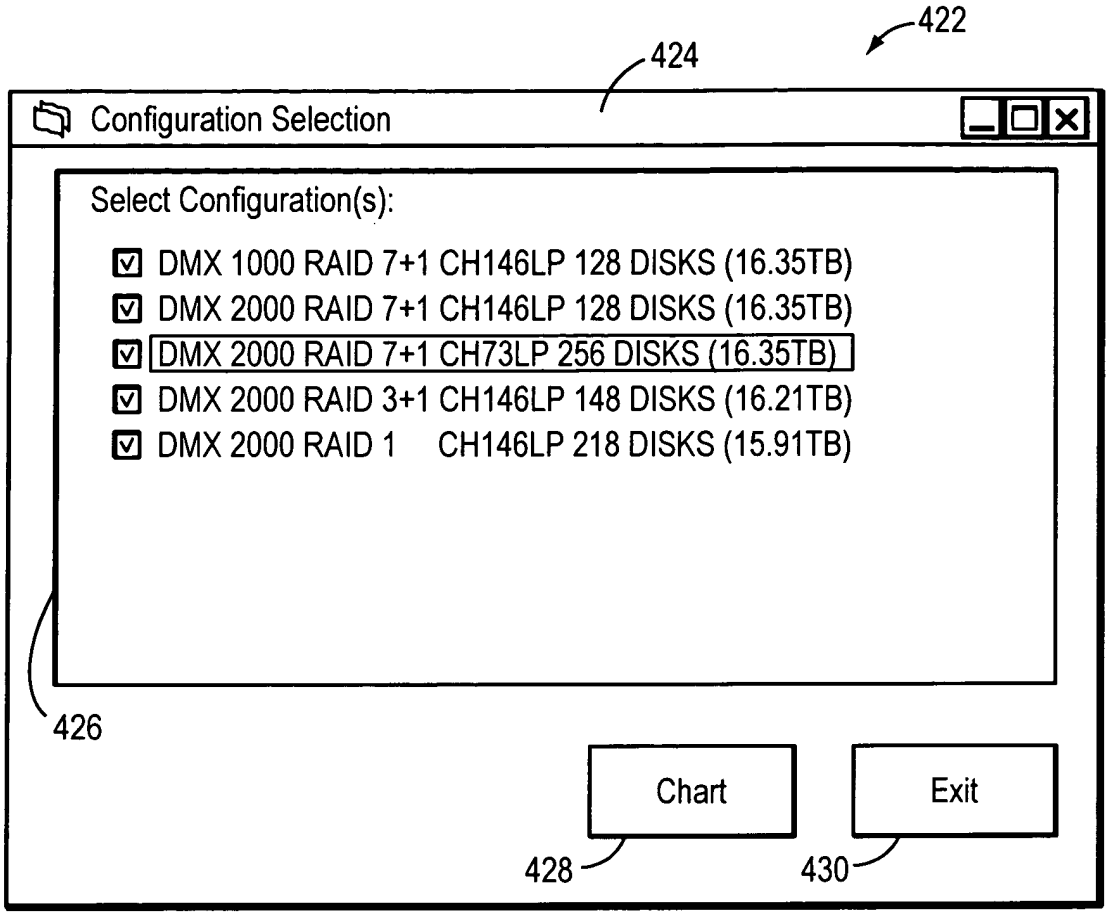
422
424
Configuration Selection
Select Configuration(s):
DMX 1000 RAID 7+1 CH146LP 128 DISKS (16.35TB)
DMX 2000 RAID 7+1 CH146LP 128 DISKS (16.35TB)
DMX 2000 RAID 7+1 CH73LP 256 DISKS (16.35TB)
DMX 2000 RAID 3+1 CH146LP 148 DISKS (16.21TB)
DMX 2000 RAID 1 CH146LP 218 DISKS (15.91TB)
426
Chart
Exit
428
430

FIG. 21

Applicants: Dan Aharoni, et al
U.S.S.N.: Not Yet Assigned
Title: *System and Method For Determining Configuration ...*
Filing Date: Not Yet Assigned / Docket No.: EMC—02-141CIP1
Attorney: Robert Kevin Perkins, Esq. (Reg. No. 36,634)
Express Mail Mailing Label No. EK900600477US



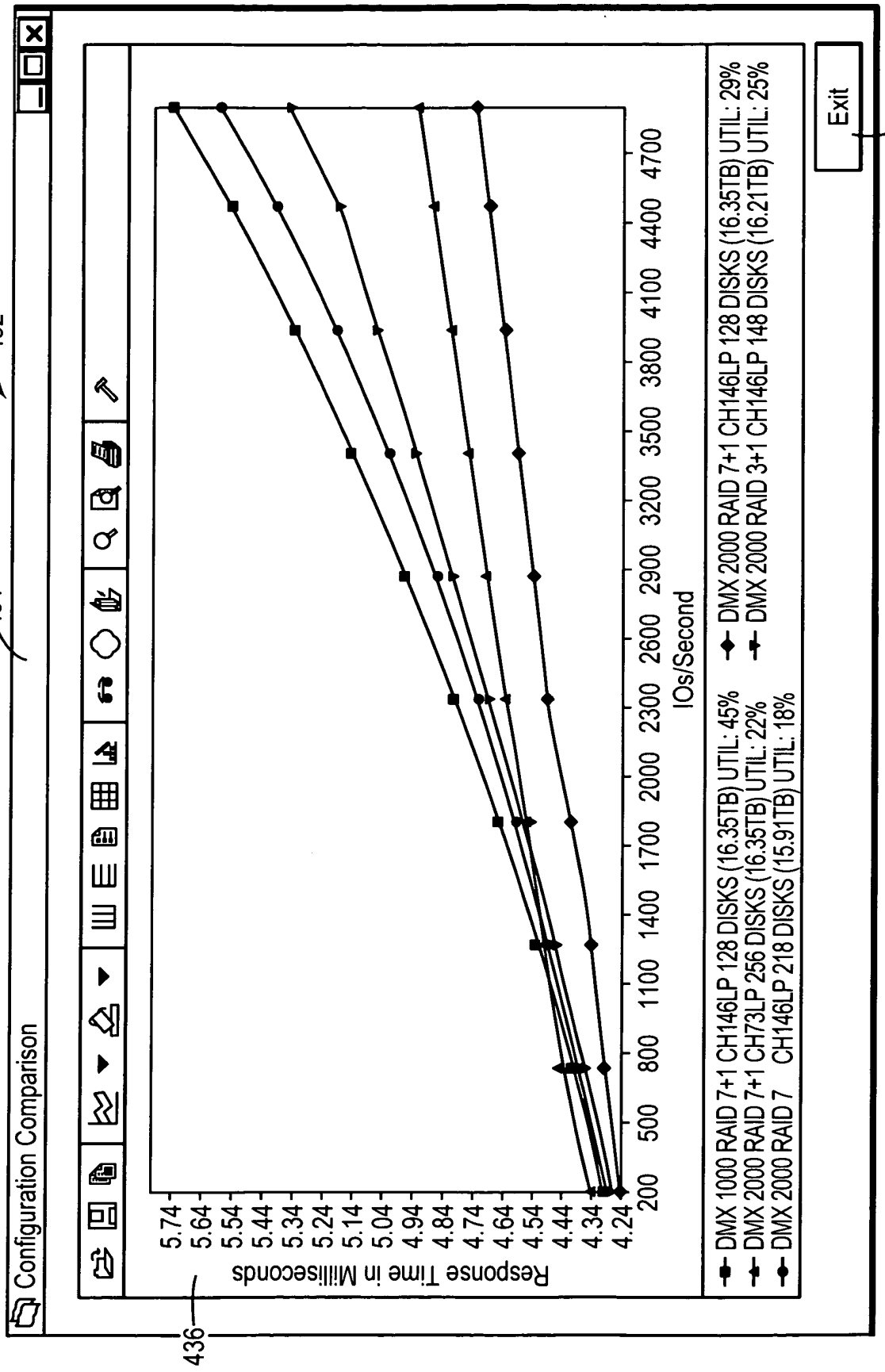


FIG. 22